Radiocarbon in Marine Dissolved Organic Matter

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povka stratum is 13,260 ± 100 BP, AA-13392. Charcoal collected without close association with artifacts and located 1 m away from any artifacts was AMS dated to 42,800 ± 1,900 BP, AA-13394.

These new ^{14}C AMS dates allow us to suggest that the appearance of pottery in the Incipient Neolithic of the lower Amur River basin could be as early as *ca.* 13,000–13,200 BP. Both the Gasya and Khummi sites have similar ^{14}C dates to the Fukui Cave and Kamikuriowa site in southern Japan (12,200–12,700 BP). Thus, the pottery appeared in the Russian Far East at a similar time to that in the southern Japanese Islands.

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RADIOCARBON IN MARINE DISSOLVED ORGANIC MATTER

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Dissolved organic carbon is the largest active reservoir of reduced carbon on Earth. It is defined as all organic material in water that passes a 0.2 micrometer filter. Part of the DOC is biologically active (young) and plays an important role in the ecology of surface waters as food source for bacteria (the microbial loop) and in the distribution of nutrients and carbon in the water column. Another part of DOC appears to be very refractive (old) and is present as a background for prolonged periods.

Analytically it is a very difficult property to measure because of its high chemical stability and its low concentration and consequent blank problems. We have developed a new method for oxidation of DOC and the recovery of the CO_2 for isotopic measurement. We use the supercritical phase as oxidation medium to ensure a complete oxidation and prevent problems with salt precipitation. This method is used for isotopic measurement of the DOC (^{13}C, ^{14}C). Knowledge of the ^{14}C content gives insight into the relation between old and young DOC and the dynamics of the old pool. At the conference this method and its first results will be presented.

FIELD VARIABILITY OF CARBON ISOTOPES IN SOIL ORGANIC CARBON

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The question of homogeneity of carbon isotopic composition of soil organic carbon becomes critical when trying to obtain some representative value for a site, and especially when attempting to quantify small changes in the isotopic composition in these carbon pools over time. Several years of free-air CO_2 enrichment (FACE) experimentation have been done at the Maricopa Agricultural Center of The University of Arizona, *ca.* 50 km south of Phoenix. Among specific investigations, the petroleum-derived CO_2 (^{14}C- and ^{13}C-depleted) used to enrich the FACE plots in cotton and wheat experiments was used as an isotopic tracer to follow atmospheric carbon into the plants and then into the soils. The early work (Leavitt *et al.* 1994) with cotton indicated an isotopic shift in $\delta^{13}C$ of the FACE